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No. Hei 7[1995]-126546

PIGMENT DISPERSANT

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PIGMENT DISPERSANT

[Ganryobunsanzai]

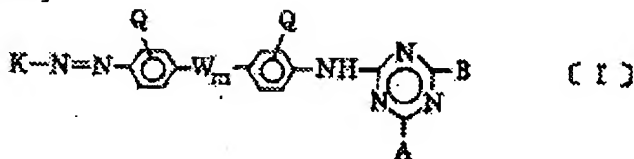
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[There are no amendments to this patent.]

Claims

1. Pigment dispersant being a compound represented by general formula [I] [Structure 1] or its metal salt or ammonium or amine salt:

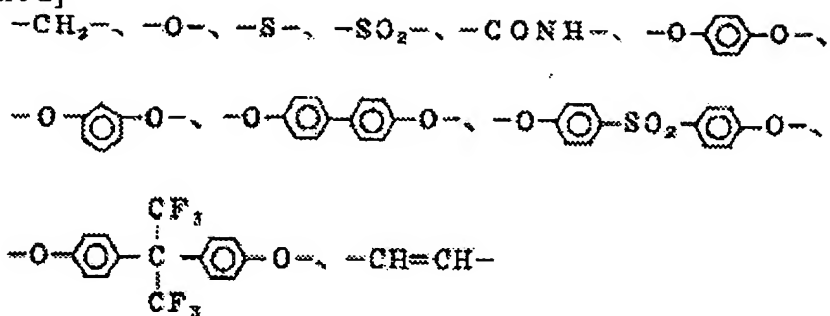
[Structure 1]



[In the formula, Q represents a hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group or hydroxy group; W represents any of the groups represented by [Structure 2]; m represents a whole number of 0 or 1.)

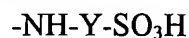
\* [Numbers in right margin represent pagination in the foreign text.]

[Structure 2]



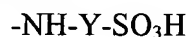
K represents a coupler component moiety for azo pigments; A and B represent a hydroxy group or group represented by [Structure 3].

[Structure 3]



Y represents an ethylene group, phenylene group or naphthylene group which may be substituted, provided that A and B are independent from each other, and that at least one of them is a group represented by [Structure 4].

[Structure 4]



2. Pigment dispersant described in Claim 1, wherein the coupler component moiety for azo pigments, K, is acetoacetanilide, pyrazoline, naphthol AS or  $\beta$ -naphthol-type coupler component moiety.

### Detailed explanation of the invention

[0001]

#### Industrial application field

The present invention concerns pigment dispersants providing pigment dispersants excellent in agglomeration resistance.

[0002]

#### Prior art

In general, agglomeration occurring when pigments are dispersed in vehicles of coating materials and inks causes various undesirable phenomena, such as poor flowability, color separation when mixed with other pigments, or coating-surface luster loss, etc.

[0003]

For improving such pigment defects, proposals have been made for pigment surface treatment by surfactants, metal soaps, various resins, etc., and utilizing various derivatives of organic pigments.

[0004]

Such proposals include, e.g., treatment of phthalocyanine blue with rosin calcium salt in U.S. Patent No. 3,296,001; treatment of lithol rubine with dialkyl sulfosuccinic acid metal salt in U.S. Patent No. 3,582,380; treatment of phthalocyanine green with aromatic polyester in U.S. Patent No. 4,391,648; or utilization of quinacridone derivatives in U.S. Patent No. 3,275,637; disazo yellow derivatives in U.S. Patent No. 3,532,520; diarylide/disazopyrazolone pigment derivatives in Japanese Kokai Patent No. Hei 3[1991]-9957.

[0005]

However, currently, azo pigments having sufficient agglomeration resistance in inks and coating materials have not been obtained.

[0006]

Problem to be solved by the invention

The present invention is to provide pigment dispersants imparting significant improvement in agglomeration properties of azo pigments in nonaqueous vehicles.

[0007]

Means to solve the problem

As a result of an intense study, we have been successful in developing pigment dispersants very useful for solving such problems. The present invention concerns pigment dispersants that are compounds represented by the general formula [I] [Structure 1] or its metal salts or ammonium or amine salts.

[Structure 1] (In the formula, Q represents a hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group or hydroxy group; W represents any of the groups represented by [Structure 2]; m represents a whole number of 0 or 1).

[Structure 2] K represents a coupler component moiety for azo pigments; A and B represent a hydroxy group or group represented by [Structure 3].

[Structure 3] Y represents an ethylene group, phenylene group or naphthylene group which may be substituted, provided that A and B are independent from each other, and at least one of them is a group represented by [Structure 4].

[Structure 4]

[0008]

Y is an ethylene group, phenylene group or naphthylene group. Typical amine components having one sulfo group are taurine, sulfanilic acid, metanilic acid, orthanilic acid, naphthionic acid, tobias acid, 2-aminophenol-4-sulfonic acid, 2-methoxyaniline-5-sulfonic acid, 4-chloroaniline-3-sulfonic acid, 2-nitroaniline-4-sulfonic acid, 4B acid (p-toluidine-m-sulfonic acid), 2B acid (o-chloro-p-toluidine-m-sulfonic acid), C acid (3-amino-6-chlorotoluene-4-sulfonic acid), CB acid (3-amino-6-chlorobenzoic acid-4-sulfonic acid),  $\gamma$  acid (2-amino-8-naphthol-6-sulfonic acid), etc.

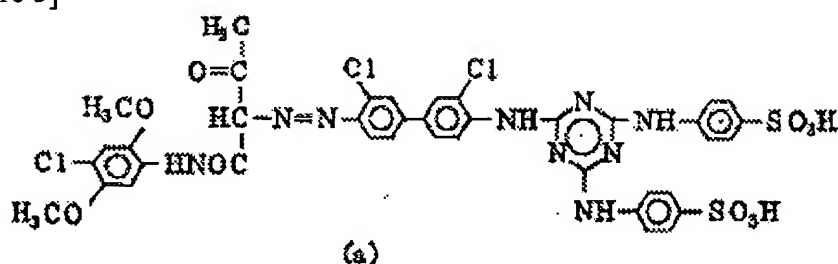
[0009]

The amines in the amine salts of the compounds represented by the general formula [I] are, e.g., stearylamine, dehydroabietylamine, etc. The metals in the metal salts may be Ba, Ca, Sr, Mn, Al, etc.

[0010]

The 2 methods described in 1) and 2) below are typical methods for making the pigment dispersants of the present invention. The preparation method is outlined with the pigment disperant (a) [Structure 5] as example.

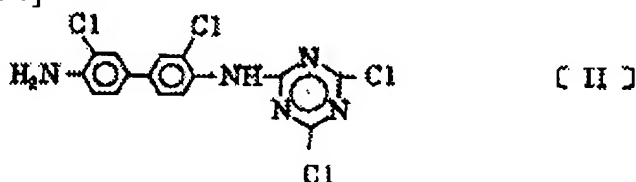
[Structure 5]



[0011]

1) First, one amino group of the 3,3'-dichlorobenzidine is reacted with cyanuric chloride to obtain the compound [II] [Structure 6].

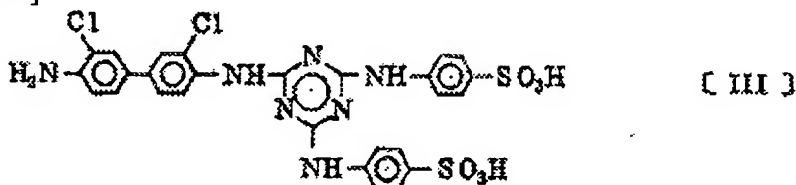
[Structure 6]



[0012]

Next, the compound [II] is reacted with sulfanilic acid to obtain the compound [III] represented by [Structure 7].

[Structure 7]



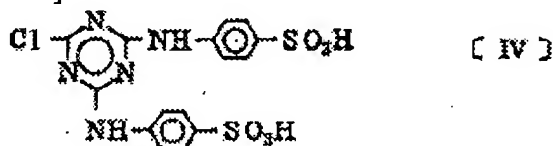
[0013]

Next, the compound [III] is diazotized and coupled with acetocet-2,5-dimethoxy-4-chloroanilide by a known method to obtain pigment dispersant (a).

[0014]

2) First, reaction of cyanuric chloride and sulfanilic acid gives compound [IV] represented by [Structure 8].

[Structure 8]



[0015]

The reaction of the compound [IV] and 3,3'-dichlorobenzidine gives the compound [III]. Next, the compound [III] is diazotized and coupled with acetoacet-2,5-dimethoxy-4-chloroanilide to obtain pigment dispersant (a). Other than 1) and 2), there are various other preparation methods.

[0016]

Function

The pigment dispersants of the present invention display excellent dispersion effects with all the commercially available pigments, while most effects are displayed with azo pigments having the same or similar coupling components. The pigment dispersants of the present invention are used in an amount of 0.5-30 parts by weight to 100 parts by weight of azo pigment. Below 0.5

parts by weight, desired effects are not realized, while above 30 parts by weight, additional effects are not realized.

[0017]

The pigment dispersants of the present invention are used usually by compounding with pigments, while they may be added with nonaqueous vehicle pigments or compounded during preparation of the pigment itself.

[0018]

For example, in the synthesis of benzidine-type disazo yellow pigment, the compound [III] (base) is added as a part of the base for tetrazotization, then coupling is carried out in a known method, resulting in direct compounding in the synthesis system without powder compounding. By any method described above, desired effects can be achieved.

[0019]

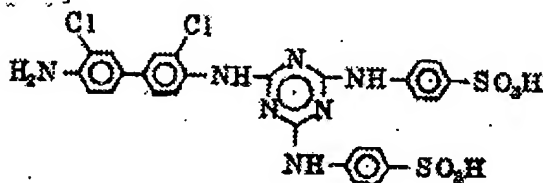
Use of the pigment dispersants of the present invention is not limited to nonaqueous vehicles of inks and coating materials, and they can be used in coloring of plastics. Next, outlines of synthetic methods of the pigment dispersants of the present invention are given as preparation examples. In the examples, parts are by weight.

[0020]

#### Preparation Example 1

A dispersion was prepared from 10 parts of 3,3'-dichlorobenzidine and 100 parts water, treated with cyanuric chloride in an amount for reacting with one amine group, allowed to react at 20°C for 1 h, treated with 13.7 parts of sulfanilic acid, reacted at 90°C for 1 h to obtain 26.6 parts of an amine having the structure of [Structure 9]

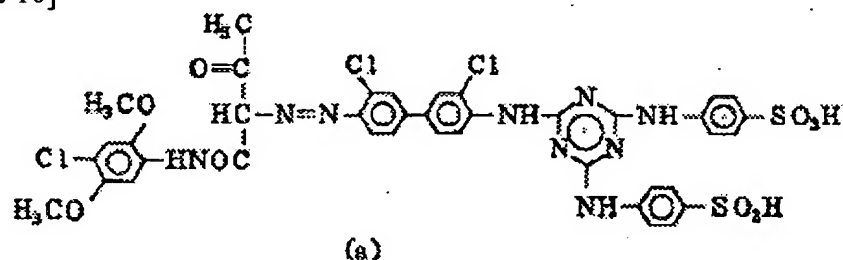
[Structure 9]



[0021]

Next, 25.0 parts of the above base were diazotized by a known method and coupled with 10.1 parts of acetoacet-2,5-dimethoxy-4-chloroanilide to obtain 35.5 parts of pigment dispersant having the structure of [Structure 10].

[Structure 10]

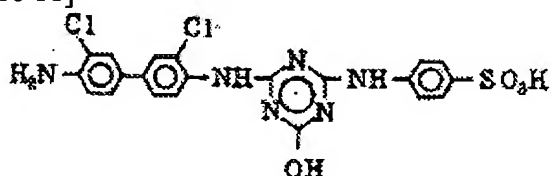


[0022]

#### Preparation Example 2

100 parts water were treated with 7.3 parts of cyanuric chloride and 6.8 parts sulfanilic acid for reaction with one Cl of the cyanuric chloride, allowed to react at 20°C for 1 h, treated with 10 parts of 3,3'-dichlorobenzidine for reaction with one Cl of the reaction product, reacted at 90°C for 1 h to obtain 20.5 parts of an amine having the structure of [Structure 11] with the remaining one Cl hydrolyzed.

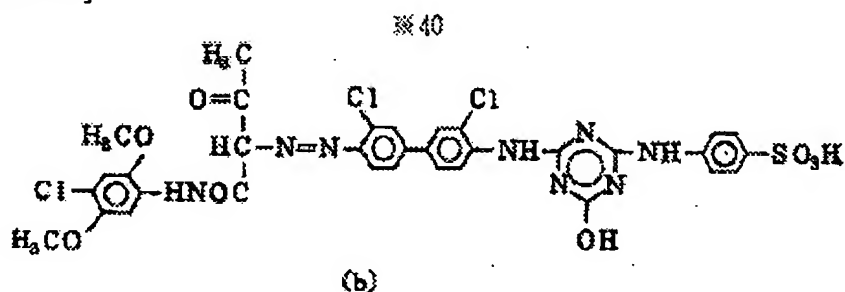
[Structure 11]



[0023]

20.0 parts of the above base were diazotized and coupled with 10.5 parts of acetoacet-2,5-dimethoxy-4-chloroanilide by a known method to obtain 30.9 parts of pigment dispersant (b) having the structure of [Structure 12]

[Structure 12]



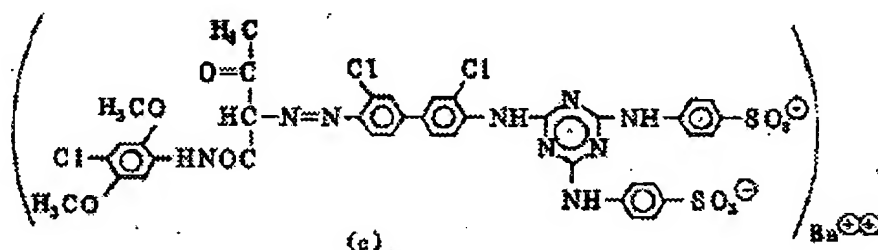


[0024]

Preparation Example 3

Preparation Example 1 was repeated up to the coupling reaction. After the coupling reaction, pH was adjusted to about 10.5 with NaOH aqueous solution, followed by laking with BaCl<sub>2</sub> aqueous solution at 45°C to obtain 40.5 parts of pigment dispersant (c) having the structure of [Structure 13].

[Structure 13]

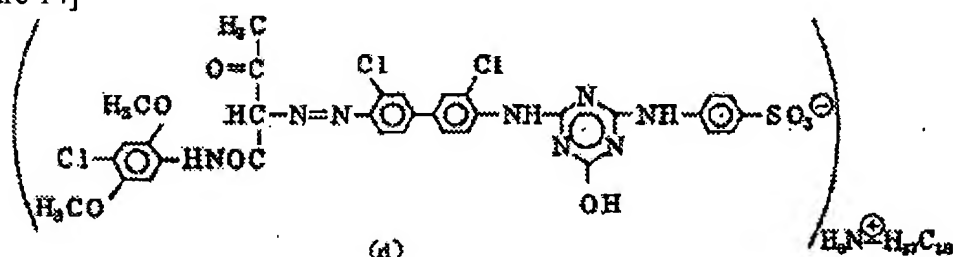


[0025]

Preparation Example 4

Preparation Example 2 was repeated up to the coupling reaction. After the coupling reaction, stearylamine acetic acid aqueous solution was added and final pH was adjusted to about 10.5 with NaOH aqueous solution, followed by filtering and washing with water to obtain 37.4 parts of pigment dispersant (d) having the structure of [Structure 14] as stearylamine salt.

[Structure 14]

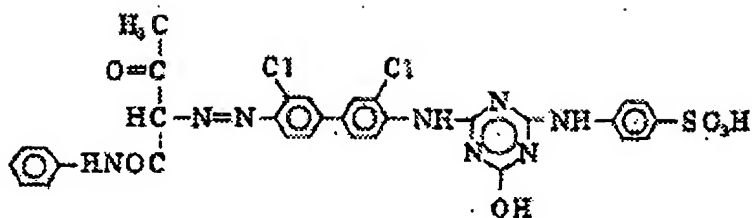


[0026]

Preparation Example 5

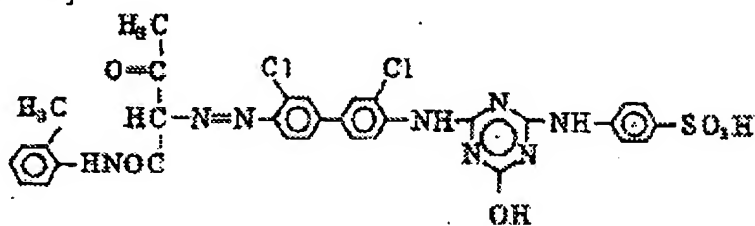
The procedure of Preparation Example 2 was repeated using the amine of Preparation Example 2 up to diazotization and coupled with acetoacetanilide, acetoacet-o-toluidide, acetoacet-o-aniside, 5-acetoacetylaminobenzimidazolone, 1-phenyl-3-methyl-5-pyrazolone, and 1-(p-tolyl)-3-methyl-5-pyrazolone to obtain pigment dispersants (e)-(j) having structures of [Structure 5]~[Structure 20].

[Structure 15]



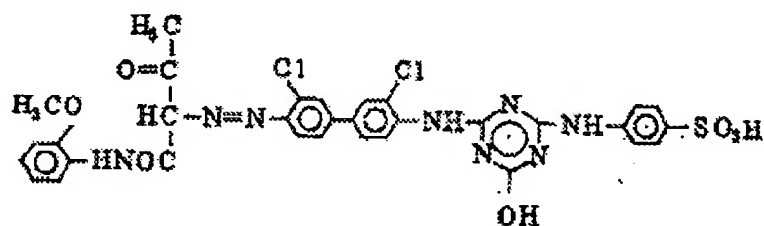
(e)

[Structure 16]



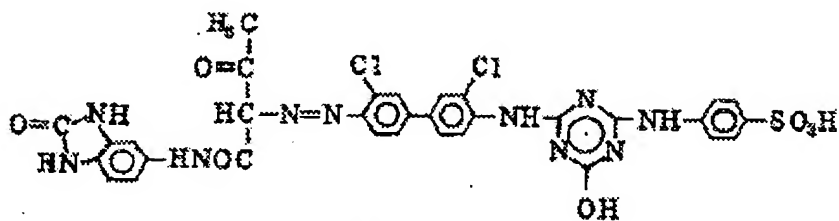
(f)

[Structure 17]



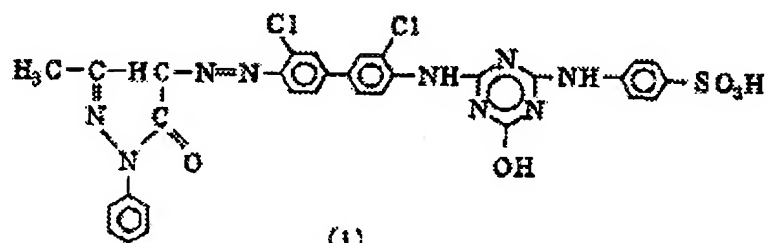
(g)

[Structure 18]



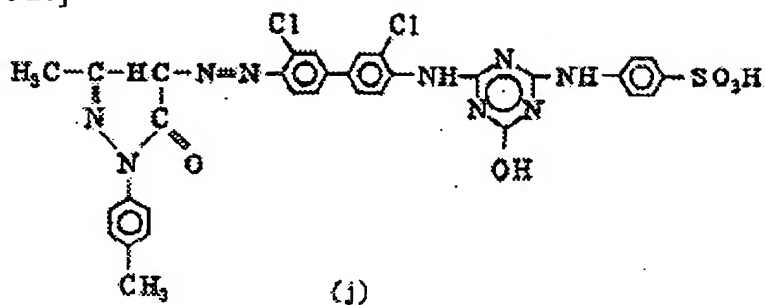
(h)

[Structure 19]



(i)

[Structure 20]

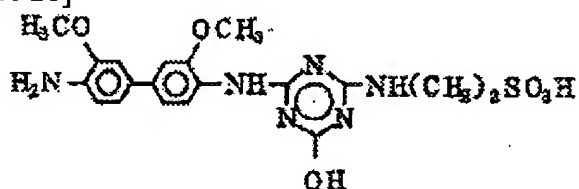


[0027]

Preparation Example 6

A dispersion of 10 parts of o-dianisidine in 100 parts water was treated with 7.6 parts of cyanuric chloride for reaction of one amino group, reacted at 30°C for 1 h, treated with 5.1 parts taurine, reacted at 80°C for 1 h to obtain 18.9 parts of an amine having the structure of [Structure 21].

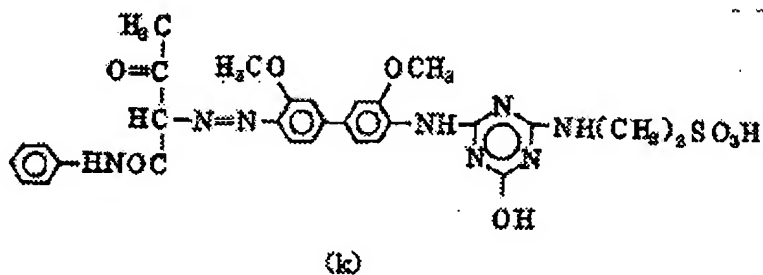
[Structure 21]



[0028]

Next, 18.0 parts of the above base was diazotized and coupled with 6.9 parts acetoacetanilide by a known method to obtain 25.0 parts of pigment dispersant (k) having the structure of [Structure 22].

[Structure 22]

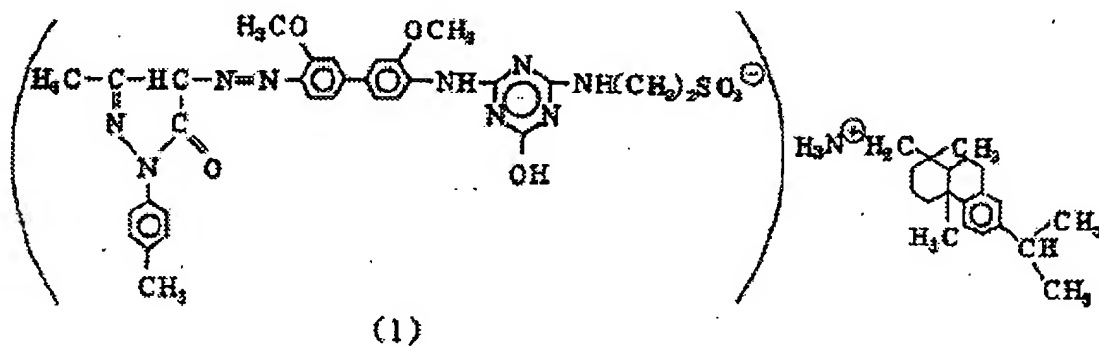


[0029]

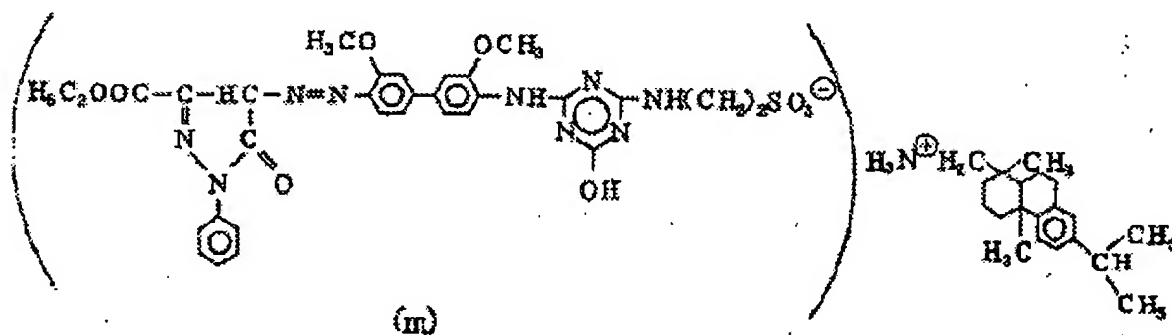
Preparation Example 7

The amine of Preparation Example 6 was similarly diazotized and coupled with 1-(p-tolyl)-3-methyl-5-pyrazolone and 1-phenyl-3-carboethoxy-5-pyrazolone and converted into dehydroabietylamine salts to obtain pigment dispersants (l) and (m) having the structures of [Structure 23] and [Structure 24].

[Structure 23]



[Structure 24]

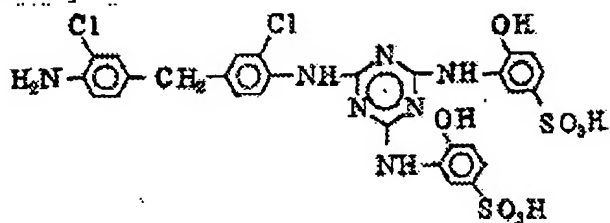


[0030]

Preparation Example 8

A dispersion of 10 parts 4,4'-methylenebis(2-chloroaniline) in 100 parts water was treated with 6.9 parts of cyanuric chloride for reaction with one amino group, allowed to react at 20°C for 2 h, treated with 14.2 parts of 2-aminophenol-4-sulfonic acid, and reacted at 90°C for 1 h to obtain 26.4 parts of an amine having the structure of [Structure 25].

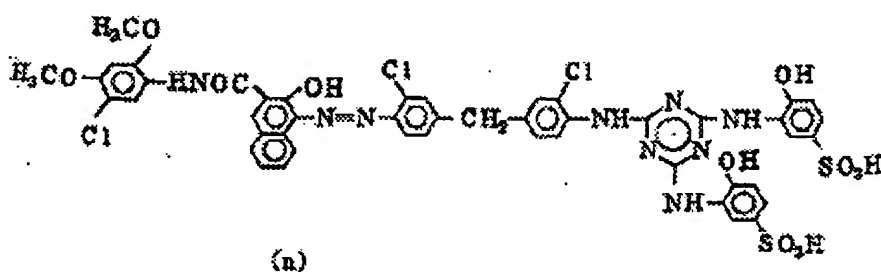
[Structure 25]



[0031]

Next, 25.0 parts of the above base was diazotized and coupled with 12.4 parts of Naphthol AS-ITR to obtain 36.3 parts of pigment dispersant (n) having the structure of [Structure 26].

[Structure 26]

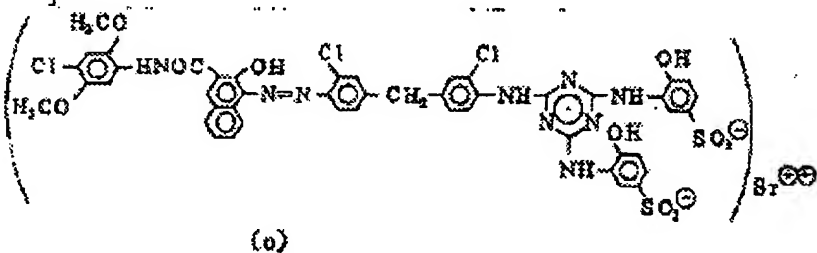


[0032]

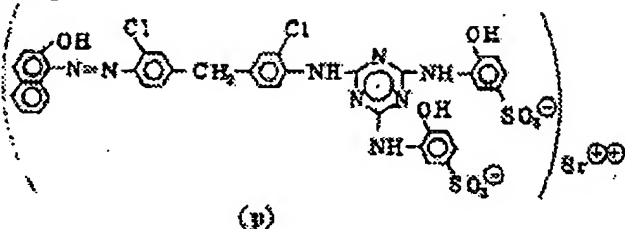
#### Preparation Example 9

The amine of Preparation Example 8 was diazotized similarly, coupled with Naphthol AS-LC and  $\beta$ -naphthol then laked with  $\text{Sr}(\text{NO}_3)_2$  to obtain pigment dispersants (o) and (p) having the structures of [Structure 27] and [Structure 28].

[Structure 27]



[Structure 28]

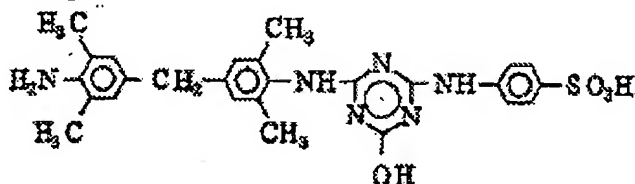


[0033]

Preparation Example 10

100 parts water was treated with 7.3 parts cyanuric chloride and 6.8 parts sulfanilic acid for reaction with one Cl of cyanuric chloride, allowed to react at 20°C for 1 h, treated with 10 parts of 4,4'-methylenebis(2,6-xylylidine) for reaction with one Cl of the above reaction product and reacted at 90°C for 2 h to obtain 20.5 parts of an amine having the structure of [Structure 29] with residual one Cl hydrolyzed.

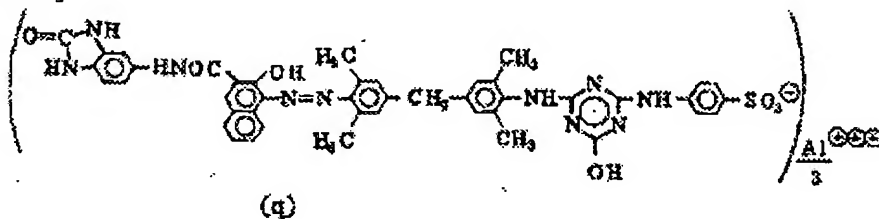
[Structure 29]



[0034]

Next, 20.0 parts of the above base were diazotized and coupled with 12.5 parts of 4-(2-hydroxy-3-naphthoylamino)benzimidazolone by a known method then laked with Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> to obtain 33.2 parts of pigment dispersant (q) of the structure of [Structure 30].

[Structure 30]

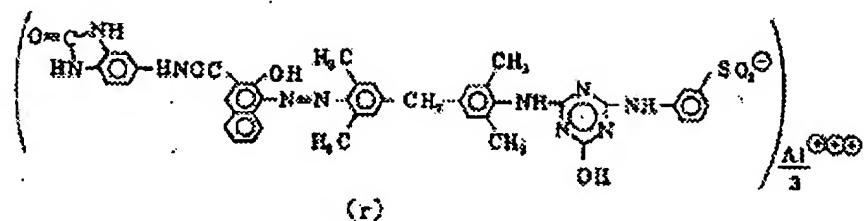


[0035]

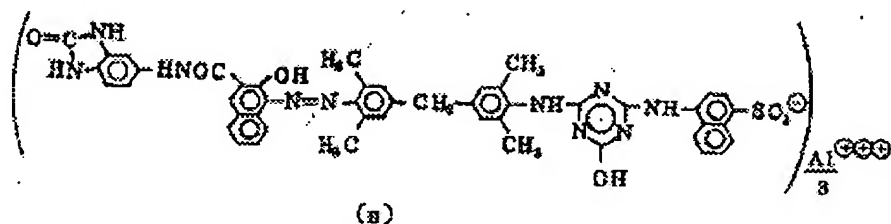
Preparation Example 11

Preparation Example 10 was repeated using metanilic acid and naphthionic acid in place of sulfanilic acid to obtain pigment dispersants (r) and (s) having the structures of [Structure 31] and [Structure 32], respectively.

[Structure 31]



[Structure 32]

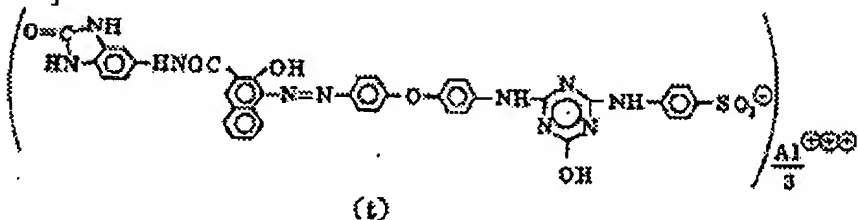


[0036]

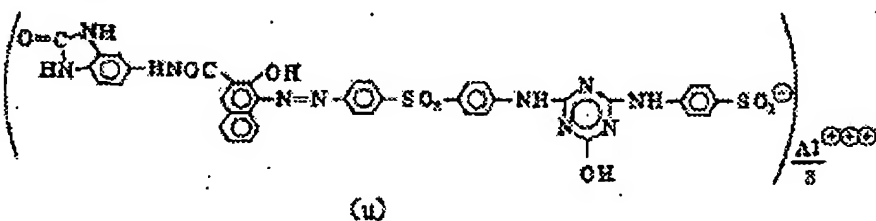
Preparation Example 12

The procedure of Preparation Example 10 was repeated using 4,4'-diaminophenyl ether, 4,4'-diaminophenyl sulfone and 1,4-bis(4-aminophenoxy)benzene in place of 4,4'-methylenebis(2,6-xylidine) to obtain pigment dispersants (t)-(v) having the structures of [Structure 33]~[Structure 35].

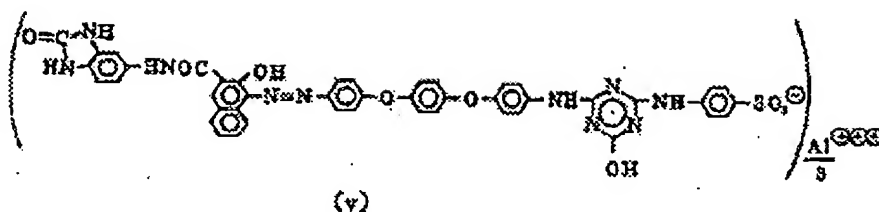
[Structure 33]



[Structure 34]



[Structure 35]



[0037]

In the preparation examples, the structures of the pigment dispersants (a)-(v) were confirmed by elemental analysis. The elemental analysis was carried out for C, H, N, Cl, and S. The analysis of C, H and N was done by automatic analyzer, and Cl and S by flask combustion-gas chromatography.

[0038]

Next, the elemental analysis results for the pigment dispersant (a) with composition formula ( $C_{39}H_{32}N_9O_{10}Cl_3S_2$ ) are given below.

		C(%)	H(%)	N(%)	O(%)	Cl(%)	S(%)	合計(%)
①	理論値	48.9	3.3	13.2	16.7	11.1	6.7	99.9
②	分析値	48.5	3.4	13.4	*16.7	11.3	6.9	100.2

④ ※ Oについては理論値の値を記入した。

Key: 1      Calculated  
 2      Found  
 3      Total  
 4      \*Calculated value is given for O.

[0039]

The analytical results of C, H, N, Cl and S are close to the calculated value, confirming that the compounds of desired structures have been obtained. Besides (a), similar elemental analysis of C, H, N, Cl and S was carried out for the pigment dispersants (b)-(v), confirming desired structures.



[0040]

Next, examples are described. In the examples, parts and percentage are by weight. The letters representing the structures of pigment dispersants are same as those given in preparation examples. In the table, the pigment dispersant represented by [ ] indicates pigment dispersant prepared using a coupler with the same structure as pigment.

[0041]

Examples

Application Example 1

C.I. Pigment Yellow 83	9.0 parts
Pigment dispersant (a)	1.0 part
Gravure urethane varnish	45.0 parts
Thinner (toluene/IPA/MEK = 40/20/40)	45.0 parts
Alumina beads (diameter: 3 mm)	100 parts

The above ingredients were placed in a 150-mL glass container and dispersed in a paint conditioner for 60 min. The resulting ink was separated from the alumina beads and measured for viscosity and luster after spreading. Results are given in Table 1, showing excellent properties.

[0042]

Comparative Example 1

An ink was prepared using 10.0 parts of Pigment Yellow 83 without adding the pigment dispersant (a) of Application Example 1.

[0043]

Application Examples 2-8

Inks were prepared by repeating Application Example 1 using 1.0 part each of the pigment dispersants (b), (c), (d), (e), (f), (g) and (h) in place of the pigment dispersant (a) of Application Example 1. Results are given in Table 1.

[0044]

Comparative Examples 2-17

Inks were prepared using 10 parts each of Pigment Yellow 12, 14, 17, 139, Pigment Orange 13, 34, Pigment Yellow 97, 74, 151, Pigment Red 37, 38, 5, 146, 3, 208 in place of Pigment Yellow 83 of Comparative Example 1, without addition of pigment dispersant. Results are given in Table 1.

[0045]

## Application Examples 9-48

Inks were prepared using the pigments of Comparative Examples 2-17 in place of Pigment Yellow 83 of Application Example 1 in various combinations with pigment dispersants (a)-(v) from preparation examples. Results are given in Table 1.

Table 1: Gravure urethane ink viscosity and luster

	(1) 顔料	(2) 顔料分散剤	(3) 粘度		(5) cps	(4) 光沢 (度)
			30rpm	60rpm	30/60比	
(6) 比較例 1	C.I.ピグメントイエロー83	—	4380	2670	1.64	68.3
(7) 実施例 1	"	(a)	117	113	1.04	87.2
" 2	"	(b)	94	92	1.02	88.6
" 3	"	(c)	102	101	1.01	85.2
" 4	"	(d)	118	116	1.03	90.6
" 5	"	e	738	516	1.43	77.4
" 6	"	f	764	527	1.45	76.3
" 7	"	g	345	261	1.32	78.8
" 8	"	h	1045	692	1.51	74.1
(6) 比較例 2	C.I.ピグメントイエロー12	—	1522	976	1.56	64.3
(7) 実施例 9	"	(e)	104	103	1.01	80.6
" 10	"	b	658	487	1.35	68.9
" 11	"	f	126	121	1.04	76.5
(6) 比較例 3	C.I.ピグメントイエロー14	—	1368	864	1.56	65.7
(7) 実施例 12	"	(f)	106	104	1.02	83.2
" 13	"	b	808	573	1.41	72.8
" 14	"	e	128	124	1.03	81.4
(6) 比較例 4	C.I.ピグメントイエロー17	—	5640	3400	1.66	71.8
(7) 実施例 15	"	(g)	128	126	1.02	89.3
" 16	"	b	863	595	1.45	79.9
" 17	"	e	386	284	1.36	80.6
" 18	"	h	1074	726	1.48	75.4
(6) 比較例 5	C.I.ピグメントイエロー139	—	1620	1060	1.72	71.6
(7) 実施例 19	"	b	356	312	1.14	85.1
" 20	"	b	808	534	1.51	77.8

	(1) 類 料	(2) 顔料 分散剤	(3) 粘 度 cps			(4) 光沢 (%)
			30rpm	60rpm	30/60比	
(6) 比較例 6	C. I. ピグメントオレンジ 13	—	886	595	1.49	64.6
(7) 実施例 21	(9) "	[i]	90	88	1.02	61.2
" 22	"	i	188	154	1.09	79.0
(6) 比較例 7	C. I. ピグメントオレンジ 34	—	1640	1045	1.57	68.3
(7) 実施例 23	(9) "	[j]	108	107	1.01	84.6
" 24	"	i	184	150	1.15	77.2
(6) 比較例 8	C. I. ピグメントエロー 97	—	2146	1320	1.62	74.1
(7) 実施例 25	"	[b]	120	118	1.02	86.3
(6) 比較例 9	C. I. ピグメントエロー 74	(8)	2080	1300	1.60	58.8
(7) 実施例 26	"	[c]	116	115	1.01	76.7
(6) 比較例 10	C. I. ピグメントエロー 151	—	862	607	1.42	72.0
(7) 実施例 27	"	[h]	97	97	1.00	83.4
(6) 比較例 11	C. I. ピグメントオレンジ 16	—	3360	2020	1.66	56.7
(7) 実施例 28	(9) "	[k]	108	103	1.05	84.0
(6) 比較例 12	C. I. ピグメントレッド 37	—	3080	1880	1.64	64.6
(7) 実施例 29	"	[l]	150	134	1.12	78.3
" 30	"	m	324	253	1.28	69.5
(6) 比較例 13	C. I. ピグメントレッド 38	—	3240	1930	1.68	59.6
(7) 実施例 31	"	[m]	108	104	1.02	80.1
" 32	"	l	264	216	1.22	73.8
(6) 比較例 14	C. I. ピグメントレッド 6	—	2460	1447	1.70	63.3
(7) 実施例 33	"	[n]	106	106	1.00	82.1
" 34	"	o	224	167	1.34	78.8
" 35	"	p	208	159	1.31	77.4
" 36	"	q	758	516	1.47	70.2
(6) 比較例 15	C. I. ピグメントレッド 148	—	1012	680	1.49	63.4

	類 料	顔料 分散剤	粘 度 cps			光沢 (%)
			30rpm	60rpm	30/60比	
(7) 実施例 37	C. I. ピグメントレッド 146	[o]	94	94	1.00	84.0
" 38	"	n	363	278	1.38	80.2
" 39	"	q	691	408	1.46	76.6
(6) 比較例 16	C. I. ピグメントレッド 3	—	1046	671	1.56	43.8
(7) 実施例 40	"	[p]	136	124	1.10	78.0
(6) 比較例 17	C. I. ピグメントレッド 208	—	1804	1074	1.68	74.6
(7) 実施例 41	"	[q]	91	89	1.02	84.8
" 42	"	n	852	552	1.54	78.2
" 43	"	o	580	400	1.45	79.1
" 44	"	[r]	98	98	1.00	85.3
" 45	"	[s]	110	109	1.01	85.0
" 46	"	[t]	105	103	1.02	84.0
" 47	"	[u]	94	92	1.02	84.6
" 48	"	[v]	116	113	1.03	82.8

Key:	1	Pigment
	2	Pigment dispersant
	3	Viscosity
	4	Luster
	5	Ratio
	6	Comparative Example ____
	7	Application Example ____
	8	C.I. Pigment Yellow ____
	9	C.I. Pigment Orange ____
	10	C.I. Pigment Red ____

[0046]

Note) Viscosity was measured using a Brookfield viscometer; luster was measured as 60°/60° reflection using a gloss meter.

As shown in Table 1, the effects are realized in all the cases with addition of pigment dispersants. Of these, most excellent effects are realized when the pigment and pigment dispersants have coupler of the same structure. Furthermore, the inks do not show any increase viscosity over a week.

[0047]

#### Application Example 49

A mixture of 10 parts acrylic copolymer of 50 wt% of n-butyl methacrylate, 30 wt% of butyl methacrylate and 20 wt% methacrylate, 74.9 parts of cyclohexanone, 14.3 parts of Pigment Yellow 83 and 0.8 part of pigment dispersant (b) was ball-milled for sufficient dispersion to obtain a yellow composition for color filter. This composition was measured for flowability and coating luster. Results are given in Table 2.

[0048]

#### Comparative Example 18

A yellow composition was prepared using 15.1 parts of Pigment Yellow 83 without addition of the pigment dispersion (b) in Application Example 49. This composition was measured for flowability and coating luster. Results are given in Table 2. (Measurements of luster and viscosity are similar as in the case of the gravure urethane inks.)

[0049]

#### Application Example 50

A yellow composition for color filter was prepared using 14.3 parts of Pigment Yellow 139 and 0.8 part of pigment dispersant (h) in place of 14.3 parts of Pigment Yellow 83 and 0.8

part of pigment dispersant (b) in Application Example 49. This composition was measured for flowability and coating luster. Results are given in Table 2.

[0050]

#### Comparative Example 19

A yellow composition was prepared using 15.1 parts of Pigment Yellow 139 without addition of the pigment dispersant (h) in Application Example 50. This composition was measured for flowability and coating luster. Results are given in Table 2.

[0051]

#### Application Example 51

A red composition for color filter was prepared using 14.3 parts of Pigment Red 208 and 0.8 part of pigment dispersant (q) in place of 14.3 parts of Pigment Yellow 83 and 0.8 part of pigment dispersant (b) in Application Example 49. This composition was measured for flowability and coating luster. Results are given in Table 2

[0052]

#### Comparative Example 20

A red composition was prepared using 15.1 parts of Pigment Red 208 without addition of the pigment dispersant (q) in Application Example 51. This composition was measured for flowability and coating luster. Results are given in Table 2.

Table 2: Viscosity and luster of resin varnish for color filter

	① 顔 料	② 顔料分散剤	③ 粘 度		④ cps	⑤ 光沢 (%)
			6rpm	60rpm	6/60比	
⑥ 比較例18	C.I.ピグメントイエロー83	—	5430	1064	5.10	75.2
⑦ 実施例49	"	⑧ (b)	113	112	1.01	99.6
⑥ 比較例19	C.I.ピグメントイエロー139	—	3650	838	4.36	68.4
⑦ 実施例50	"	h	94	92	1.02	87.4
⑥ 比較例20	C.I.ピグメントレッド208	—	4270	886	4.82	71.8
⑦ 実施例51	"	⑨ (q)	108	107	1.01	96.0

Key: 1 Pigment  
2 Pigment dispersant  
3 Viscosity  
4 Luster

5	Ratio
6	Comparative Example ____
7	Application Example ____
8	C.I. Pigment Yellow ____
9	C.I. Pigment Red 208

[0053]

As shown in Table 2, even in the resin varnishes for color filters, compounding with the pigment dispersants of the present invention gives excellent results in flowability and luster.

[0054]

The pigments treated with the pigment dispersants of the present invention show good dispersibility without agglomeration in nitrocellulose lacquers, baked melamine-alkyd coatings, room temperature curable alkyd coatings, urethane resin coatings, acrylic lacquers, aminoacrylic resin baked coatings, polyamide/nitrocellulose inks, various rosin-modified resin offset inks, lime rosin inks, vinyl chloride resin inks, etc.

[0055]

Effect of the invention

The pigment dispersants of the present invention display significantly improved effects for all azo pigments in nonaqueous vehicles such as coating materials and inks, with significantly improved flowability of inks and coating materials and pigment agglomeration prevention, giving coatings with bright excellent luster. Furthermore, the pigment dispersants of the present invention can be prepared easily and are very useful.